Offline LabVIEW-based EEG Signals Analysis for Human Stress Monitoring

Norizam Sulaiman
Faculty of Electrical & Electronics Engineering
Universiti Malaysia Pahang, Pekan, Pahang, Malaysia
norizam@ump.edu.my

Beh See Ying, Mahfuzah Mustafa, Mohd Shawal Jadin
Faculty of Electrical & Electronics Engineering
Universiti Malaysia Pahang, Pekan, Pahang, Malaysia
behseeying94@gmail.com

ABSTRACT:
Stress is often known as a state of mental or emotional tension resulting from adverse or demanding circumstances. People nowadays are faced stress and different people will have different level of stress and it might be difficult to analyse. Hence, EEG technology is invented to assist people to determine the level of stress by using brain signals. Thus, this paper describes the development of a LabVIEW-based system that can determine the level of stress based on the analysis of brain signals in LabVIEW. In this study, 1-channel EEG amplifier are employed to record EEG signals from five subjects at three different cognitive states which are closed eyes (do nothing), playing game and doing IQ test. The EEGID application in mobile phone is used to capture recorded EEG signals from EEG amplifier and then the EEG signals are transfer to computer through Bluetooth for analysis which involves noise filtering, power spectrum conversion, features extraction and classification stage. The result shows that the average centroid which was applied on the EEG Power Spectrum of Alpha band is higher than Beta band when subject is at relax cognitive state meanwhile the average centroid of EEG Power Spectrum of Beta band is higher than Alpha band when subject is at stress cognitive state. Thus, it can be concluded that the subject are in the stress cognitive state when playing game and doing IQ test. At the end of this project, the LabVIEW Graphical User Interface (GUI) is created to display the level of stress for each subject after undergoing several mental exercises. Beside LabVIEW GUI, a device is constructed to display the level of stress in offline manner..

Keywords - stress; EEG, LabVIEW; Alpha band, Beta band power spectrum; average centroid; offline